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 Materia: Probabilidad y Estadística
 Carrera: Ingeniería de Sistemas
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Calificación:

UPS

Deber #5.

(1) $f(x, y) = C(x, y)$

$x = 1, 2, 3$

$y = 1, 2, 3$

$C(1)(1) = 1C$

$C(2)(1) = 2C$

$C(3)(1) = 3C$

$C(1)(2) = 2C$

$C(2)(2) = 4C$

$C(3)(2) = 6C$

$C(1)(3) = 3C$

$C(2)(3) = 6C$

$C(3)(3) = 9C$

$\sum C(x, y) = 1C + 2C + 3C + 2C + 4C + 6C + 3C + 6C + 9C$
 $= 36C$

$36C = 1$

$C = \frac{1}{36}$

$f(x, y) = C|x - y|$

$x = -2, 0, 2$

$y = -2, 0, 2$

$C|-2 - (-2)| = 0C$

$C|0 - 2| = 2C$

$C|2 - 2| = 0C$

$C|-2 - 0| = 2C$

$C|0 - 0| = 0C$

$C|2 - 0| = 2C$

$C|-2 - 2| = 4C$

$C|0 - 2| = 2C$

$C|2 - 2| = 0C$

$\sum C(x, y) = 0C + 2C + 0C + 2C + 0C + 2C + 4C + 2C + 0C = 16C$

$16C = 1$

$C = \frac{1}{16}$

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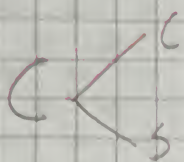
2)

$R = \# \text{ caras}$

$W = \# \text{ TOTAL CARAS EN LOS DOS LANZAMIENTOS}$

$C = 0,4$

$S = 0,6$

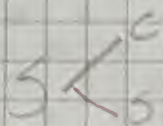


$C C \quad \frac{2}{3} \cdot \frac{1}{4} = \frac{2}{25}$

$0 = \frac{9}{25}$

$C S \quad \frac{2}{3} \cdot \frac{3}{5} = \frac{6}{25}$

$1 = \frac{12}{25}$



$S C \quad \frac{3}{5} \cdot \frac{2}{3} = \frac{6}{25}$

$2 = \frac{4}{25}$

$S S \quad \frac{3}{5} \cdot \frac{3}{5} = \frac{9}{25}$

$W = \# \text{ TOTAL CARAS}$

$P(W \geq 1) = 0,24 + 0,24 + 0,16 = 0,64$

W	$g(w)$
0	$9/25$
1	$12/25$
2	$4/25$

R	$\# \text{ CARAS}$
0	$0,6$
1	$0,4$

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$$3) f(x, y) = \frac{9}{16} \cdot \frac{1}{4^{(x+y)}}$$

$$x = 0, 1, 2$$

$$y = 0, 1, 2$$

$$\frac{9}{16} \cdot \frac{1}{4^{(0+0)}} = \frac{9}{16}$$

$$\frac{9}{16} \cdot \frac{1}{4^{(1+0)}} = \frac{9}{64}$$

$$\frac{9}{16} \cdot \frac{1}{4^{(2+0)}} = \frac{9}{256}$$

$$\frac{9}{16} \cdot \frac{1}{4^{(1+1)}} = \frac{9}{256}$$

$$\frac{9}{16} \cdot \frac{1}{4^{(0+2)}} = \frac{9}{256}$$

$$\frac{9}{16} \cdot \frac{1}{4^{(1+2)}} = \frac{9}{1024}$$

$$\frac{9}{16} \cdot \frac{1}{4^{(2+2)}} = \frac{9}{256}$$

$$\frac{9}{16} \cdot \frac{1}{4^{(2+1)}} = \frac{9}{1024}$$

$$\frac{9}{16} \cdot \frac{1}{4^{(2+2)}} = \frac{9}{4096}$$

$$\frac{9}{16} \cdot \frac{1}{4^{(2+3)}} = \frac{9}{16384}$$

$$\frac{9}{16} \left(1 + \frac{1}{4} + \frac{3}{4} + \frac{1}{4} + \frac{1}{4^2} + \frac{1}{4^3} \right) - \frac{9}{16} \left(\frac{1}{4} + 1 + \frac{1}{4^2} + \frac{1}{4^3} \right) = \frac{63}{64}$$

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4)

$$u = E(x) = \sum x \cdot f(x)$$

$$CC \quad 3/2 \cdot 3/2 = 9/4$$

$$CS \quad 3/2 \cdot 1/2 = 3/4$$

$$SC \quad 1/2 \cdot 3/2 = 3/4$$

$$SS \quad 1/2 \cdot 1/2 = 1/4$$

$$0 \quad 9/4$$

$$1 \quad 3/2$$

$$2 \quad 1/4$$

$$u = 0(9/4) + 1(3/2) + 2(1/4) = 3/2 + 1/2 = 2 \quad R/1$$

5) $D(x) = 1/2 + 1/12, 1/4, 1/4, 1/6, 1/6$

X	f(x)
4	1/12

5	1/12
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6	1/4
---	-----

7	1/4
---	-----

8	1/6
---	-----

9	1/6
---	-----

$$\text{dinero en } \$ = 2x - 1$$

$$E(x) = \sum x \cdot f(x)$$

$$E(x) = [2(4-1)](1/12) + [2(5-1)](1/12) +$$

$$2(6-1)(1/4) + 2(7-1)(1/4) + 2(8-1)(1/6) +$$

$$2(9-1)(1/6) =$$

$$7(1/12) + 8(1/12) + 11(1/4) + 13(1/4) + 15(1/6) + 17(1/6) = 12,67 \quad R/1$$

6)

X	P(x)
0	0,1
1	0,2
2	0,3
3	0,4

$$\mu = \sum x P(x) = 0 \left(\frac{1}{10} \right) + 1 \left(\frac{1}{5} \right) + 2 \left(\frac{3}{10} \right) + 3 \left(\frac{2}{5} \right) = \frac{12}{5}$$

$$\sigma^2 = \sum (x - \mu)^2 P(x) = \left(0 - \frac{12}{5} \right)^2 \left(\frac{1}{10} \right) + \left(1 - \frac{12}{5} \right)^2 \left(\frac{1}{5} \right) + \left(2 - \frac{12}{5} \right)^2 \left(\frac{3}{10} \right) + \left(3 - \frac{12}{5} \right)^2 \left(\frac{2}{5} \right) =$$

$$\frac{72}{125} + \frac{49}{125} + \frac{6}{125} + \frac{18}{125} = \frac{29}{125} = 1,16$$

7)

	X	
f(x,y)	2	4
1	0,10	0,15
3	0,20	0,30
5	0,10	0,15

$$E(2x - 3y) = \sum x f(x) = (2(2) - 3(1)) (0,10) + (2(2) - 3(3)) (0,20) + (2(2) - 3(5)) (0,10) + (2(4) - 3(1)) (0,15) + (2(4) - 3(3)) (0,30) + (2(4) - 3(5)) (0,15) = \frac{1}{10}$$

$$\frac{1}{10} + (-1) + \left(-\frac{11}{10} \right) + \frac{3}{4} + \left(-\frac{3}{10} \right) + \left(-\frac{21}{20} \right) = -\frac{13}{5} = -2,6$$

$$E(xy) = \sum x F(x) = (2(1)) (0,10) + 2(3) (0,20) + 2(5) (0,10) + 4(1) (0,15) + 4(3) (0,30) + 4(5) (0,15)$$

$$\frac{1}{5} + \frac{6}{5} + \frac{1}{5} + \frac{3}{5} + \frac{18}{5} + 3 = \frac{48}{5}$$

8)

Y = utilidades

P(Y) = Probabilidad

X	P(Y)
15000	0,05
0	0,15
15000	0,15
25000	0,30
40000	0,15
50000	0,10
100000	0,05
150000	0,03
200000	0,02

$$\sum x P(x) = (15000)(0,05) + 0(0,15) + 15000(0,15) + 25000(0,30) + 40000(0,15) + (50000)(0,10) + 100000(0,05) + 150000(0,03) + 200000(0,02)$$

35000

$$\sigma^2 = (x - \mu)^2 P(x) = (15000 - 35000)^2(0,05) + (0 - 35000)^2(0,15) + (15000 - 35000)^2(0,15) + (25000 - 35000)^2(0,30) + (40000 - 35000)^2(0,15) + (50000 - 35000)^2(0,10) + (100000 - 35000)^2(0,05) + (150000 - 35000)^2(0,03) + (200000 - 35000)^2(0,02) = 1,80 \times 10^8$$

$$\sigma = 1341640,786 \quad \text{R4}$$

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9) $X = \#$ Cojas registradoras 1

$Y = \#$ Coja registradora 2

X	Y		
	0	1	2
0	0,12	0,04	0,04
1	0,08	0,19	0,05
2	0,06	0,12	0,30

$$\begin{aligned} \sum Y P(Y) &= 0(0,12) + 0(1)(0,04) + (0)(2)(0,04) + 1(0)(0,08) + \\ &+ 1(1)(0,19) + 1(2)(0,05) + 2(0)(0,06) + 2(1)(0,12) + \\ &+ 2(2)(0,30) = \end{aligned}$$

$$0,19 + 0,1 + 0,24 + 1,2 = 1,73 \quad R//$$